REMARKS

Applicants respectfully request that the above application be reconsidered in view of the above amendments and the following remarks, which are believed to place the application in condition for allowance.

Claims 1, 4-14, and 16-20 are currently pending. Nonelected Claims 21-30 have been canceled without prejudice to prosecuting such claims in a divisional application.

Claim 1 has been amended to more explicitly state that the rotor component is a compressor disk, a compressor seal element, a turbine disk or a turbine seal element as disclosed in paragraphs [0003] to [0005], [0016], [0022] and [0027] of the specification. Claim 14 has been amended in a similar manner using Markush language. As suggested by the Examiner, Applicants have more precisely defined the invention so that it is clear that the term "compressor" in the claims refers to a compressor disk or a compressor seal element.

No new matter is introduced by the above amendments, and it is requested that they be entered.

A. Rejection of Claims 1 and 4-11 under 35 USC 103(a) as being unpatentable over Schaeffer et al. (U.S. 5,780,110), and optionally further in view of Weimer et al (U.S. 6,532,657 B1)

As amended, Applicants' Claim 1 specifies that the turbine engine rotor component is a compressor disk, a compressor seal element, a turbine disk or a turbine seal element (hereinafter referred to as "disks and seal elements"). As described in paragraph [0004] of the specification, such disks and seal elements are made of nickel-base superalloys selected for good elevated temperature strength and fatigue resistance. However, as noted in paragraph [0005], such disks and seal elements typically have not been coated to protect them against oxidation and corrosion. Various oxidation-resistant and corrosion-resistant coatings used on turbine blades are generally too thick and heavy for use on disks and seal elements, and may adversely affect fatigue life of disks and seal elements.

Schaeffer discloses that the adhesion between the bond coat and thermal barrier coating on turbine blades and vanes can be improved by forming an oxide coating at the bond coat/TBC interface. Schaeffer describes surface doping of the bond coat with Fe, Cr or Y using various methods, one of which is ion implantation. Although Schaeffer generally mentions articles and

components for use in turbine engines, only blades and vanes (or airfoils) are specifically disclosed. See FIG. 1; Col. 1, lines 14, 20, 35 and 42; Col. 2, line 48; Col. 3, lines 54-55; and Col. 4, line 28. Schaeffer does not disclose disks or seal elements as in the present invention. As noted above, such disks and seal elements typically have not been coated to protect them against oxidation and corrosion. Coatings typically used on turbine blades and vanes, such as disclosed in Schaeffer, generally are too thick and heavy for use on disks and seal elements and may adversely affect fatigue life of disks and seal elements. Schaeffer states in Col. 4, lines 33-40 that the turbine blade of FIG. 1 preferably has a bond coat thickness of 2-4 mils (about 50-100 microns) and a TBC thickness of 5-15 mils (about 125-375 microns). Thus, the total coating thickness on the Schaeffer blades/vanes can be 175-475 microns. In sharp contrast, Applicants' disks and seal elements have an oxide coating thickness of from about 0.5 to about 5 microns. See paragraph [0024] of the application and claims 13 and 20. Paragraph [0025] also notes that more complex protective coatings, such as thicker aluminide diffusion coatings or overlay coatings and thermal barrier coatings, are often used on portions of turbine engine components having service operating temperatures exceeding 815°C (such as the coatings used on turbine blades/vanes described in Schaeffer).

Moreover, in Applicants' invention, the aluminum or chromium ions are implanted into the surface of the rotor component (i.e., the surface of the disk or seal element) (see the last line of Claim 1 and part (b) of Claim 14), not into a bond coat on a turbine blade/vane as in Schaeffer. Schaeffer discloses surface doping of the bond coat to improve adhesion between the bond coat and the thermal barrier coating. Applicants' disks and seal elements do not have bond coats or thermal barrier coatings for the reasons outlined above. Schaeffer does not disclose surface doping of the blade/vane itself, only the bond coating thereon. Schaeffer nowhere suggests ion implantation of disks and seal elements, or other turbine engine components that do not have a bond coat and thermal barrier coating. Thus, Schaeffer does not render obvious Claims 1 and 4-11, and it is requested that this rejection be withdrawn.

Weimer is cited as disclosing the formation of an oxidized coating on disks and seal elements to protect them from corrosion. However, Weimer does not disclose implanting aluminum or chromium ions into the surface of disks or seal elements prior to forming the oxidized coating, which results in the more stable protective coating of the present invention. Thus, Weimer adds little or nothing to support the rejection of claims based on Schaeffer.

Accordingly, it is requested that the rejection of Claims 1 and 4-11 as obvious over Schaeffer, and optionally in view of Weimer, be withdrawn.

Paragraph 7 of the Office Action states that the patents of Naik, Bedell, and Manty remain relevant as teaching references for the reasons cited in the May 8, 2007 Office Action. As discussed in Applicants' Response dated August 8, 2007, these patents all relate to coatings on turbine and compressor blades. As noted in the cited portions of Naik, Bedell and Manty, these are titanium alloys, not nickel-base alloys useful as disks and seal elements as in the present invention. None of these references disclose disks and seal elements made of nickel alloys. Accordingly, it is submitted that the present claims would not have been obvious over Schaeffer, optionally considering Naik or Bedell or Manty.

B. Rejection of Claims 12-14 and 16-20 under 35 USC 103(a) as being unpatentable over Schaeffer et al. (U.S. 5,780,110), and further in view of Weimer et al (U.S. 6,532,657 B1)

For the reasons outlined above, it is submitted that Claims 12-14 and 16-20 would not have been obvious over Schaeffer, and further in view of Weimer. Accordingly, it is requested that this rejection be withdrawn.

C. Rejection of Claims 1, 4-14 and 16-20 under 35 USC 103(a) as being unpatentable over Zhao et al (U.S. 6,964,791 B2) in view of Schaeffer et al. (U.S. 5,780,110), and further in view of Weimer et al (U.S. 6,532,657 B1)

As amended, Applicants' Claim 1 specifies that the turbine engine rotor component is a compressor disk, a compressor seal element, a turbine disk or a turbine seal element made of a nickel-base alloy and having a service operating temperature of from about 540°C to about 815°C. Zhao relate to various coatings for turbine engine components, but does not disclose implantation of aluminum or chromium ions into the surface of disks and seal elements as claimed herein. As also noted above, disks and seal elements typically have not been coated to protect them against oxidation and corrosion, and coatings used on blades/vanes are generally too thick and heavy for use on disks and seal elements and may adversely affect their fatigue life. In any event, Zhao is disqualified from being used in a rejection under 35 USC 103(a) against the present claims by virtue of the following statement of common ownership.

The present U. S. Patent Application Serial No. 10/634,543 and U. S. Patent 6,964,791 B2 were, at the time the invention of Application Serial No. 10/634,543 was made, owed by General Electric Company.

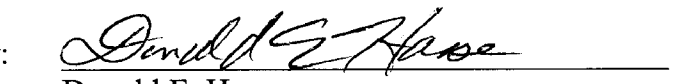
For the reasons outlined above and regarding the Schaeffer reference, it is submitted that Claims 1, 4-14 and 16-20 would not have been obvious over Zhao in view of Schaeffer, and further in view of Weimer, and Zhao is disqualified from being used in a rejection under 35 USC 103(a) against the present claims by virtue of the above statement of common ownership. Accordingly, it is requested that this rejection be withdrawn.

D. Conclusion

It is believed that the above represents a complete response to the Examiner's rejections and places the application in condition for allowance. Accordingly, reconsideration and allowance of Claims 1, 4-14 and 16-20 is respectfully requested.

Applicants would appreciate a telephone call should the Examiner have any questions or comments with respect to this response.

Respectfully submitted,
For: Ramgopal DAROLIA et al.

By: 

Donald E. Hasse
Attorney for Applicants
Registration No. 29,387
(513) 229-0383
Customer Number 31838

January 17, 2008